

## 3.5. Calculating the Static Safety Factor

To calculate a load applied to the LM Guide, the average load required for calculating the service life and the maximum load needed for calculating the static safety factor must be obtained first. In a system subject to frequent starts and stops, placed under cutting loads or under a large moment caused by an overhang load, an excessively large load may apply to the LM Guide. When selecting a model number, make sure that the desired model is capable of receiving the required maximum load (whether stationary or in motion). Table 9 shows standard values for the static safety factor.

Table 9 Standard Values for the Static Safety Factor ( $f_s$ )

Machine using the LM Guide	Loading conditions	Lower limit of $f_s$		
General industrial machinery	Without vibration/impact	1 to 1.3	When the radial load is large	$\frac{f_H \cdot f_T \cdot f_C \cdot C_0}{P_R} \geq f_s$
	With vibration/impact applied	2 to 3	When the reverse-radial load is large	$\frac{f_H \cdot f_T \cdot f_C \cdot C_{0L}}{P_L} \geq f_s$
Machine tool	Without vibration/impact	1 to 1.5	When the lateral loads are large	$\frac{f_H \cdot f_T \cdot f_C \cdot C_{0T}}{P_T} \geq f_s$
	With vibration/impact applied	2.5 to 7		

$f_s$  : Static safety factor

$C_0$  : Basic static load rating (radial direction) (N)

$C_{0L}$  : Basic static load rating (reverse-radial direction) (N)

$C_{0T}$  : Basic static load rating (lateral direction) (N)

$P_R$  : Calculated load (radial direction) (N)

$P_L$  : Calculated load (reverse-radial direction) (N)

$P_T$  : Calculated load (lateral direction) (N)

$f_H$  : Hardness factor (see Fig. 11 on page A-76)

$f_T$  : Temperature factor (see Fig. 12 on page A-76)

$f_C$  : Contact factor (see Table 10 on page A-76)